FY02-03 Accountability Report
South Carolina Sea Grant Consortium

"Science Serving South Carolina's Coast"

Date: 9 October 2003

FY02-03 ACCOUNTABILITY REPORT

SOUTH CAROLINA SEA GRANT CONSORTIUM

Section I:

EXECUTIVE SUMMARY

General Information and Mission Overview

The S.C. Sea Grant Consortium, created in 1978 by the S.C. General Assembly, is charged with managing and administering the Sea Grant Program and related activities to support, improve, and share research, education, training, and advisory services in fields related to ocean and coastal resources. The Consortium's unique mission is to maximize the economic, social, and environmental potential of the coastal and marine resources of the state and region, and the agency does so by serving as a broker of information and funding.

The Consortium develops and supports a balanced and integrated research, education, and extension program for South Carolina which seeks to provide for future economic opportunities, improve the social well-being of its citizens, and ensure the wise use and development of its marine and coastal natural resources. It also administers an effective and efficient communications and extension network among academia, business, government, and the general public to ensure that Consortium activities are responsive to marine and coastal users and that information generated is delivered in a useful and timely fashion. The S.C. Sea Grant Consortium is part of a nationwide network of 30 Sea Grant Programs that report to the National Sea Grant College Program, NOAA, U.S. Department of Commerce; thus, Consortium activities are responsive to regional and national needs, as well as to those of South Carolina. It is unique among Sea Grant programs in that it is an academically based state agency.

Institutions which hold membership in the Consortium include The Citadel, Clemson University, Coastal Carolina University, the College of Charleston, the Medical University of South Carolina, South Carolina State University, S.C. Department of Natural Resources, and the University of South Carolina. Consortium institutions provide the expertise of their respective faculty and professional staffs, as well as a wide range of facilities and equipment, necessary to carry out the diversity of programs supported by the Consortium.

In addition to the direct relationship with its member institutions, the Consortium interacts with numerous other local, state, and federal agencies, businesses, industries, and non-profit organizations to identify issues and opportunities and form partnerships to address the needs of its diverse constituencies.

The Consortium's overarching goal of maximizing the potential of the state's coastal and marine resources is a broad one. To effectively direct its day-to-day activities toward this goal, the Consortium organizes its research, education, extension, and management activities in nine programmatic areas tied to nine strategic goals. These nine goals are **new** to this reporting period, and they reflect the Consortium’s concern that we address the relevant and

pressing coastal and marine resource management and utilization needs of South Carolina. Based on these goals, the Consortium staff developed a 2002 Work Plan designed to achieve them by focusing efforts on priority issues. All agency employees and their job functions are included in the 2002 Work Plan so that it is truly a team effort guided by one vision and mission for each individual's effort. This enables us to look at our results in a manner that is more in lock-step with the Baldrige Excellence Criteria. The Consortium's strategic goals are:

Strategic Goal 1: Maintain and enhance a management system and engaged administrative staff which supports the programmatic goals of the research, education and extension programs of the SCSGC.

Strategic Goal 2: Identify and understand the processes dominating the coastal ocean of the South Atlantic Bight as they affect coastal processes, pollution of the coastal zone, fisheries dynamics, and mineral resources management, and are influenced by global climate change.

Strategic Goal 3: Enhance the availability and quality of marine, estuarine, and freshwater resources that can support the economic and quality-of-life needs of South Carolina's public and private sectors.

Strategic Goal 4: Examine the forces of climate and hazards, and to provide information to the public and private sectors on the nature of hazards and how to plan for them.

Strategic Goal 5: Develop techniques, technologies, and new products based on marine systems for use in commercial and industrial applications, and to continue to apply low-cost technologies to coastal and marine resource problems.

Strategic Goal 6: Enhance the development of viable and sustainable aquaculture and fisheries in South Carolina and the region.

Strategic Goal 7: Develop and implement activities to assist coastal communities and small businesses with growth management and sustainable economic development strategies.

Strategic Goal 8: Design and implement educational programs that foster a more scientifically and environmentally informed citizenry.

Strategic Goal 9: Promote the development of a diverse and technically trained workforce.

Efforts distributed among these goal areas provide a balanced program, which is central to achieving the major goals of the agency.

Strategic Planning and Program Goals

The goal of the Consortium's strategic planning process is to maximize the ability of S.C. Sea Grant's research, education, and outreach programs to address the coastal resource needs of South

Carolina. To this end, the Consortium's strategic planning process has identified three concepts that provide the foundation for future Sea Grant activities:

- To develop and maintain an integrated Sea Grant Program for South Carolina that seeks to provide for future economic opportunities, improve the social well being of its citizens, and ensure the sustainable use and development of its marine and coastal natural resources.

- To continue to build an effective and efficient research, education, communications and extension network among academia, business, government, and the general public to ensure that Consortium activities are responsive to marine and coastal users and that information generated is delivered in a timely fashion.

- To remain an integral component of the National Sea Grant College Program where Consortium activities are responsive to regional and national needs, as well as to those of South Carolina.

Results

The National Sea Grant College Program is specific in requiring compliance with a merit review process for member institutions based on program evaluations performed every four years by a Program Assessment Team (PAT). The South Carolina Sea Grant Consortium's last evaluation was conducted in 1999. The Consortium received an "Excellent" rating, and our outstanding performance resulted in an increase of $140,000 in our Core budget with Federal funds coming from the National Sea Grant College Program. The Consortium will receive this annual increase until the next Program Assessment, which will take place in June 2004.

The Consortium's total annual budget for FY02-03 was $5,911,500, representing a 4 percent decrease from FY01-02. This compares with a 5 percent increase in the previous reporting period. The FY02-03 numbers represent the first decrease in the Consortium's budget in six years, and only the second time in the past 15 years. This modest decrease in the Consortium's total budget is a reflection, for the most part, of the state's current budgetary woes.

The Consortium experienced a decrease in its non-state funding level from $5,580,900 to $5,385,300, a $195,600 decrease from FY01-02. (See Table 7.1.5A , page 27).

The S.C. General Assembly's commitment to and support of the S.C. Sea Grant Consortium has positioned it to be able to successfully compete for non-state funding, and with only 9 percent of its budget (same as previous reporting period) coming from state appropriations, the Consortium represents a highly leveraged, cost-effective investment by the State of South Carolina.

Nevertheless, while the varied constituencies of the S.C. Sea Grant Consortium have benefited from the agency's long-term non-state budgetary growth to support relevant research, education, and extension programming, the agency continues to require additional state funding for program coordination, fiscal management, and administrative support to handle the ever-increasing public demand for Consortium products, services, and activities. As noted in last year's report, coastal growth will continue to remain a primary natural resource management issue for the state into the foreseeable future. In fact, anecdotal information suggests that we have approached a point where

research and outreach funding is not keeping pace with the needs to address critical issues resulting from the increasing pressures of population growth along the coast of South Carolina.

The Consortium's FY02-03 state appropriation ($499,837) was actually lower that year then it was in FY90-91 ($518,100) in FY90-91, and these figures are **not** adjusted for inflation. The Consortium's state appropriation is critical to the agency for two reasons: it supports the Consortium's management, operational, and administrative functions, and it is used by the agency to meet the federal Sea Grant match requirement of $1 in non-federal funds for every $2 in federal Sea Grant funds.

In addition, the Consortium's state FTE total *decreased* by 0.7 FTEs. In FY90-91, the Consortium employed 9 state-funded FTE positions. Currently, the Consortium employs 8.3 state-funded FTE positions, but **three** of these positions are now vacant due to state budget reductions. These vacancies represent a ***20 percent*** **reduction** in Consortium staff strength. The agency is indeed doing more with less, but it is now faced with the prospects of having to scale back its very successful efforts due to the limiting effects of significant state budget reductions on its ability to secure and adequately administer and manage additional non-state funding for its constituent-driven programs.

At the heart of the Consortium's mission are the efforts of Sea Grant-supported scientists. In the agency's solicitation process for competitive proposals for the FY04-06 biennium, which was initiated in March 2003, the Consortium experienced a 6 percent increase in pre-proposals (65) submitted for review and evaluation. Thirty-four (34) pre-proposals were invited to submit full proposals, representing a 52% success rate, and a 9% increase over the previous cycle. A technical panel was convened August 25-26, 2003, to determine which of these will be funded in FY04-06.

Results of the Consortium's research, education, and extension programs and activities supported by competitive grants from the Consortium's core Sea Grant program, the National Sea Grant College Program Office's National Strategic Initiatives, and other funding agencies, as well as our success with the Dean John A. Knauss and Coastal Management Fellowship competitions, can be found in Category 7.

Section II:

BUSINESS OVERVIEW

1. Number of FTEs

The S.C. Sea Grant Consortium currently has 14 FTEs; 8.33 state FTEs and 5.67 federal FTEs. The trend in number of FTEs essentially has remained constant over time (see Figure 7.1-5 D). Currently, of the Consortium's 14 FTE positions, **three** are now vacant due to state budget reductions. These vacancies represent a ***20 percent*** **reduction** in Consortium staff strength.

2. Operation Location

The Consortium's main office is located at 287 Meeting Street in Charleston, South Carolina. Specialists working for the S.C. Sea Grant Extension Program are located in offices in Charleston, Conway, and Georgetown, South Carolina.

3. Expenditures/Appropriations Chart

Base Budget Expenditures and Appropriations

	01-02 Actual Expenditures		02-03 Actual Expenditures		03-04 Appropriations Act	
Major Budget Categories	**Total Funds**	**General Funds**	**Total Funds**	**General Funds**	**Total Funds**	**General Funds**
Personal Service	$ 594,801	$ 321,708	$ 633,719	$ 215,370	$ 777,530	$ 252,529
Other Operating	$ 501,948	$ 128,195	$ 483,861	$ 114,618	$ 655,745	$ 105,745
State Aid	$ 2,550	$ 2,550	$ 995	$ 995	$ 1,956	$ 1,956
Allocations	$ 3,874,425	$ 0	$ 4,547,235	$ 0	$ 7,950,000	$ 0
Fringe Benefits	$ 133,275	$ 78,239	$ 148,111	$ 74,218	$ 178,479	$ 80,275
Total	**$ 5,106,999**	**$ 530,691**	**$ 5,813,921**	**$ 481,201**	**$ 9,526,210**	**$ 440,505**

Other Expenditures

Sources of Funds	00-01 Actual Expenditures	01-02 Actual Expenditures	02-03 Actual Expenditures
Information Technology	$ 0	$3,660	$7,933

4. Key Customers

Because of the unique nature of the Consortium's mission, we do not have "customers" as such. Instead, we serve many constituencies, through the provision of information and funding, including faculty, staff, and students of our eight member institutions; federal, state, and local natural resource and economic development agencies; institutions and individuals involved in the management of the state's coastal resources; state and local government officials and community leaders; K-12 teachers and students; non-governmental organizations; business and industry, citizen groups; and the general public.

5. Key Suppliers

The Consortium depends on the expertise and knowledge of the faculty, staff, and students of its member institutions, as well as its own, to generate, translate, and deliver pertinent coastal and marine resource-related information to its constituents. It also depends on the success of the proposals it prepares and/or submits on behalf of its member institutions to secure the financial resources necessary to support the myriad of activities with which it is engaged.

6. Major Products and Services

The Consortium's major products and services fall into the following categories:

- Marine and coastal research that delivers applied, science-based information to educate individuals, businesses, local and state government, and other organizations on the balanced use and conservation of coastal and ocean resources.
- Extension, advisory services, and technical assistance activities (such as workshops, seminars, constituent meetings, etc.) focusing on coastal hazards, environmental and water quality issues, coastal recreation and tourism, aquaculture, and coastal community development.
- Community-based volunteerism, through marine litter and habitat restoration projects (e.g., Beach Sweep/River Sweep; Oyster Reef Restoration).
- Communications products (print, media, Web-based) that inform and educate citizens about the issues relevant to life, work, and along the coast of South Carolina (e.g., *Coastal Heritage* magazine).

The Consortium organizes its research, education, and extension activities in nine programmatic areas tied to nine strategic goals. These nine goals are **new** to this reporting period, and they reflect the Consortium's concern that it address the relevant and pressing

coastal and marine resource needs of South Carolina. Based on these goals, the Consortium staff developed a 2002 Work Plan designed to achieve them by focusing efforts on priority issues. All agency staff participate in developing the Work Plan, and each has responsibilities for completing tasks as identified in the annual plan, so that it is truly a team effort guided by one vision and mission for each individual's effort. This enables us to look at our results in a manner that is more in lock-step with the Baldrige Excellence Criteria. The Consortium's strategic goals follow:

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Strategic Goal 8: Design and implement educational programs that foster a more scientifically and environmentally informed citizenry.

Strategic Goal 9: Promote the development of a diverse and technically trained workforce.

7. Organizational Structure

The S.C. Sea Grant Consortium is structured to optimize communication and feedback linkages necessary for the proper development and implementation of its programs. Activities of the Consortium are governed by authorizing committees of the S.C. General Assembly and a Board of Directors to which the Executive Director reports. The Board of Directors includes the chief executive officers of the Consortium's member institutions:

S.C. Sea Grant Consortium Board of Directors

Dr. Ronald R. Ingle, Chair
President
Coastal Carolina University
Conway, SC 29528

M. Gen. John S. Grinalds
President
The Citadel
Charleston, SC 29409

Dr. James F. Barker
President
Clemson University
Clemson, SC 29634

Leo I. Higdon
President
College of Charleston
Charleston, SC 29424

Dr. Raymond S. Greenberg
President
Medical University of South Carolina
Charleston, SC 29403

Paul A. Sandifer
Executive Director
S.C. Department of Natural Resources
Columbia, SC 29202

The Honorable Ernest A. Finney, Jr.
Interim President
S.C. State University
Orangeburg, SC 29117

Dr. Andrew Sorensen
President
University of South Carolina
Columbia, SC 29208

The Board meets annually to review Consortium program policies and procedures. The Board also provides a direct line of communication between the Consortium Agency Head and the higher administrative levels of its eight member institutions. An organizational chart depicting the administrative structure of the S.C. Sea Grant Consortium can be found as Appendix A.

Section III:

MBNQA CATEGORIES

Category 1 – Leadership
1.1-1.7

1.1 Organizational Approach

To ensure that all Consortium staff understand the agency's strategic plan and quality expectations, a Consortium-wide planning session (typically in a retreat setting; annually when feasible) is conducted in which information about the agency's mission, goals, and objectives is explained and discussed, and staff are encouraged to share their ideas about ways to improve the agency's performance. Monthly staff meetings provide another forum for sharing information and discussing the Consortium's progress toward strategic goals.

The Consortium also addresses its strategic goals and day-to-day business requirements through meetings of its "Core Group" on a monthly basis. The Core Group consists of the Agency Head, the Assistant Director for Administration and Management, the Sea Grant Extension Program Leader, the Assistant to the Director for Program Management, the Assistant to the Director for Program Development, and the Communications Director. Each member represents the program activities and staff within his/her division, and collectively the group discusses short- and long-term program priorities, budget and staff needs, constraints and issues, and future opportunities.

1.2. Leadership Activities – Agency Head

The South Carolina Sea Grant Consortium staff plays key leadership roles in organizations, professional societies, and activities that advance the mission of the Consortium and the visibility of the state of South Carolina, and enable it to better serve the needs of its constituencies. Selected activities of the Agency Head include:

1.2.1 State Activities

- Organizer and Chair, South Carolina Task Group on Harmful Algae, an organization of state and federal agencies, universities and others to develop strategies to deal with harmful algae blooms. The Task Force meets twice per year.
- Member, Advisory Board of the Water Resources Center, Strom Thurmond Institute, Clemson University.
- Board Member, Lowcountry Institute, Spring Island, S.C.
- Vice President of the 113 Calhoun Street Foundation Board of Directors.
- Member, Management Committee, State of the Harbor - Charleston Harbor Project (under the auspices of SCDHEC/OCRM)
- Member, Study Team to assist the South Carolina Shrimp Industry.
- Organizer and Facilitator, coastal and ocean research discussion group (with representatives of SCMRD, University of South Carolina, Clemson University, Coastal Carolina University,

University of Charleston, SC, and NOAA/NOS-Charleston Laboratory to explore the development of a coordinated state coastal and ocean research strategy.
- Invited Speaker, Clemson University Biodiversity Seminar Series, on *The Land Use-Coastal Ecosystem Study (LU-CES): An Attempt to Bridge the Science-Policy-Decision-Making Gap*, Clemson, SC, February 20, 2003.
- Invited Finals Moderator, South Carolina-Georgia Regional National Ocean Sciences Bowl competition, Columbia, S.C., March 1, 2003.
- Reappointed - Adjunct Professor in the Marine Biology Graduate Program at the Graduate School of the College of Charleston on May 13, 2003.

1.2.2. Regional Activities

- Co-chair, Southeast Coastal Ocean Science Conference and Workshop, organized by the Consortium, the NOAA Coastal Services Center, the College of Charleston, and others, held on January 27-31, 2003 in Charleston, S.C. and attended by over 150 participants from the southeastern United States and elsewhere.
- Co-Principal Investigator and Executive Committee Member, SouthEast Center for Ocean Science Education Excellence (SE-COSEE), one of seven regional ocean science centers funded by the National Science Foundation to enhance ocean sciences education nationwide. SE-COSEE is funded at ~$300K per year for three years.
- Selected as a member of the Governing Board and serves as an associate investigator of SEA-COOS (the Southeast Atlantic Coastal Ocean Observing System), a regional coastal ocean observing system program administered by the University of North Carolina system with funding provided by the Office of Naval Research.
- Principal Investigator, NOAA Coastal Services Center-funded project titled "Southeast Regional Association for Coastal Ocean Observations (SERA-COOS): Building a Regional Association Framework for the Coastal Ocean Observing System of the Southeastern United States."
- Invited Speaker and Panelist, Annual Conference of the Tri-state (FL, GA, SC) Soil and Water Conservation Society, Jekyll Island, GA, May 29, 2003.
- Co-editor (with Gary S. Kleppel and Mac Rawson), *Implications of Land-use Change to Coastal Ecosystems: Challenges to Effective Management*, a book to be published by Springer-Verlag in 2004.

1.2.3. National Activities

- Completed term on December 31, 2002 as President of the national Sea Grant Association (SGA), a federation of the 30 Sea Grant College Programs located in every coastal and Great Lakes state.
- On January 1, 2003 appointed Chairman of the SGA External Relations Committee (ERC), responsible for directing SGA policy and legislative efforts with representatives of NOAA, OMB, Congress, and other NGOs.
- Co-chair, National Sea Grant Theme Team on Coastal Natural Hazards, one of ten national planning groups made up of scientists, extension specialists, educators, and government representatives charged with developing the national Sea Grant agenda for this and other topics.

- Organized and held a leadership retreat for the SGA, National Sea Grant office staff, and members of the National Sea Grant Review Panel to discuss legislative and programmatic issues. The retreat was held in Charleston, S.C. on July 29 & 30, 2002.
- Formal participant, as SGA president, National Sea Grant Review Panel (NSGRP), a FACA-approved committee charged with overseeing the National Sea Grant College Program office. The NSGRP reports to the Secretary of the U.S. Department of Commerce.
- Formal member, as SGA President and ERC Chair, Coastal Coordination Committee, a group comprised of the Acting Assistant Administrator of NOAA's National Ocean Service, the National Sea Grant College Program Director, Executive Director of the Coastal States Organization, among others, whose goal is to integrate program activities across NOAA.
- Invited Participant, Workshop on Ocean Education, NOAA Office of Ocean Exploration, Charleston, S.C., September 4-6, 2002.
- Invited Panelist, *The Importance of Extension and Outreach in Homeland Defense* - "Homeland Security: A New Paradigm for Universities," a program of the Board on Oceans and Atmosphere – NASULGC Annual Meeting, Chicago, IL, November 11, 2002.
- Prepared and submitted, on November 18, 2002, a paper titled *Marine Aquaculture in the United States: Policy Options* at the formal request of the U.S. Commission on Ocean Policy.
- Co-founder and co-chair, International Conference on Shellfish Restoration (ICSR). ICSR'02 was held on November 20-24, 2002 in Charleston, S.C., with over 200 attendees participating.
- Co-convener, Special Session on *Impacts of Changing Land Use on Aquatic Ecosystems*, American Society of Limnology and Oceanography (ASLO), Salt Lake City, UT, February 8-14, 2003.
- Invited Speaker, ASLO, on *The Land Use-Coastal Ecosystem Study: Minimizing Ecological Impacts in Rapidly Urbanizing Coastal Regions*, American Society of Limnology and Oceanography (ASLO), Salt Lake City, UT, February 8-14, 2003.
- Prepared and submitted, on May 5, 2003, a chapter section for the U.S. Commission on Ocean Policy final report titled *Marine Aquaculture* at the formal request of the U.S. Commission on Ocean Policy.
- Invited Speaker, Panel on Coastal Natural Hazards before the House Oceans Caucus, Washington, DC, June 10, 2003.

1.2.4. Other Activities

- Co-founder and co-chair of the International Conference on Shellfish Restoration (ICSR). ICSR'02 is scheduled for November 20-24, 2002 in Charleston, S.C.; ICSR'00 was held November 14-18, 2000 on Hilton Head Island, with over 200 participants.
- Co-chair of the Southeast Coastal Ocean Science Conference and Workshop, being organized by the Consortium, the NOAA Coastal Services Center, the College of Charleston, and others, scheduled for Fall, 2003.

1.3. Leadership Activities - Consortium Staff

Employees are encouraged to join and actively participate in professional organizations. Examples include:

1.3.1. Local

- Fort Johnson Seminar Series – committee member
- Maritime Association of the Port of Charleston - member
- Nonpoint Education for Municipal Officials - program coordinator

1.3.2. State

- S.C. Aquaculture Association - charter member and advisor
- S.C. Shrimp Growers Association - advisor
- S.C. DHEC/DNR Mariculture Regulatory Committee - member
- S.C. Dept. of Health and Environmental Control - member, Nonpoint Source Task Force
- S.C. Farm Bureau - adviser, Aquaculture Commodities Committee
- ACE (Ashepoo-Combahee-Edisto) Basin Economic Forum - member
- North Inlet-Winyah Bay National Estuarine Research Reserve - member, Advisory Board
- Clemson/SCDNR Cooperative Fisheries Unit - coordinator
- S.C. Governmental Finance Officers -- member
- S.C. Rural Economic Development Council - member
- S.C. Information Resources Council - member, Standing Committee on Geographic Information
- S.C. Mapping Advisory Committee - member
- S.C. Marine Educators Association - member
- S.C. Economic Development Association - member
- S.C. Chapter, American Planning Association - member
- S.C. DNR Marine Advisory Committee, Disease Introductions Subcommittee - advisor
- S.C. Association of Environmental Professionals – member
- Leadership, South Carolina – graduate, Class of 2001
- Coastal Pesticide Advisory Council (CPAC) – on-going member
- S.C. Task Group on Toxic Algae - member
- S.C. Aquatic Plant Management Society Board of Directors (2001)
- SCDNR Exotic Species Introductions Sub-Committee
- S.C. Government Webmasters Association (2002)
- S.C. Harmful Algae Task Force, communications officer (2001-2002)
- Fiscal Manager, *113 Calhoun Street*

1.3.2. National and Regional

- Atlantic States Marine Fisheries Commission – Aquaculture Committee
- Southern Task Force on Wetlands and Endangered Species Issues, Cooperative Extension Service – member
- National Marine Educators Assn. - member
- Southeastern Estuarine Research Society – member
- Society of Research Administrators – member
- Sea Grant Association – fiscal officer
- International Personnel Managers Association – member
- The Coastal Society – registrar (2000)

Category 2 – Strategic Planning
2.1-2.2

The goal of the Consortium's strategic planning process is to maximize the ability of S.C. Sea Grant's research, education, and outreach programs to address the coastal and marine resource needs of South Carolina and its citizens. The objectives of the strategic planning process are to:

- Receive input from constituents and stakeholders
- Update the existing strategic plan based on the input received
- Use the strategic plan to guide programs

The Consortium's ability to anticipate and respond to constituent needs is critical to its success in serving the state. The Consortium employs several planning tools to ensure that its programs are achieving the maximum possible benefits. These include both formal and informal mechanisms.

2.1. Strategic Planning Process

To determine how the Consortium's existing strategic plan (1997-2001) addresses the needs of the State, the Consortium's Core Group reviewed that plan in 1998 and agreed to initiate an update. The Core Group felt that the major program areas identified in the existing plan remain relevant, however, suggestions of specific action steps were needed for how best to achieve the plan's goals. A series of focused workshops were held with stakeholders to address these goals and were reflected in Consortium activities through FY2001.

During this reporting period (FY02-03) the Consortium's Core management group conducted an internal planning process to review its programmatic areas and update strategic goals. The previous six program areas (Coastal Ocean Studies, Ecosystem Dynamics, Climate and hazards, Emerging Technologies, Sustainable Economic Development, and Marine Education) were evaluated and reorganized into the following performance-based set of nine strategic goals:

1. Program Management
2. Coastal and Ocean Processes
3. Ecosystem Dynamics
4. Coastal Natural Hazards
5. Emerging Technologies
6. Marine Aquaculture and Fisheries
7. Coastal Communities and Economies
8. Public Awareness and Outreach
9. Marine Education and Training

The above referenced planning process is designed to identify:

- Priority needs in South Carolina pertaining to the area of concern.
- Current activities in South Carolina in the area of concern.
- Priority needs in areas of concern that are not being adequately addressed by current activities.
- Specific potential actions that the Consortium could take to address these unmet needs.

2.2. Development and Tracking

The results of the 1998-1999 workshops have been incorporated into the Consortium's 2000-2003 Strategic Plan. The Consortium views its Strategic Plan as a dynamic document; at all times there are planning activities occurring. Implementation of one element of the plan often leads to identification of a new need, which is then incorporated into the plan for implementation, and so on. Also, the input from this process is incorporated into the Consortium's biennial Request for Proposals (RFP) to ensure that program areas, objectives, and priorities continue to meet the changing needs of our stakeholders and enable the agency to successfully meet its mission goals.

A formal internal strategic planning process encompassing all program areas was initiated during the fall and winter of 2002-2003. The process helped shape the future directions, priorities and objectives of the Consortium. Out of this process, the Consortium develops a detailed work plan that specifies task to be completed during the subject year. At the end of the annual cycle, a report on each task included in the Work Plan is provided. The agency is now revising its strategic plan, which will cover the next four-year period of 2004-2007. The Consortium's long-term goal is to conduct a formal and thorough review of each of the Consortium's nine strategic program areas every four years, and again, involve stakeholders in this process through communications mechanisms like workshops and Web-base surveys that include feedback loops.

2.3. Communication and Deployment

The Consortium's 2000-2003 strategic plan, and its 2004-2007 revision, formed the basis for the agency's Sea Grant biennial Request for Proposals for FY2002-2004 and FY2004-2006.

The goal of the strategic planning process is to maximize the ability of S.C. Sea Grant's research, education, and outreach programs to address the coastal and marine resource needs of South Carolina. In addition to its on-going strategic planning process, the Consortium utilizes other means to enhance its ability to identify constituent groups and their needs. It does this through interaction with members of the Consortium's Board of Directors, liaisons at the Consortium's member institutions, Blue Ribbon Committees, its Sea Grant Extension Program specialists, and its Communications and Information Services staff.

Category 3 – Customer Focus
3.1-3.6

3.1. Key Customers and Stakeholders

As previously mentioned, the Consortium's constituencies consist of the faculty, staff and students of the agency's eight member institutions, as well as an extremely diverse group of organizations and individuals representing universities, federal, state, and local natural resource and economic development agencies, business, industry, state and local governments, community groups, non-governmental organizations (NGOs), K-12 teachers and students, and others. Simply put, the Consortium's mission is to serve the coastal and marine resource needs of all who live, work, and play in South Carolina and throughout the southeastern United States. The Consortium's motto is: ***"Science Serving South Carolina's Coast."***

The Consortium serves its member institutions: The Citadel, Clemson University, College of Charleston, Coastal Carolina University, Medical University of South Carolina, South Carolina State University, S.C. Department of Natural Resources, and University of South Carolina. Federal organizations with which the Consortium has collaborated during FY02-03 included the NOAA National Sea Grant College Program, NOAA Coastal Services Center, NOAA National Marine Fisheries Service, NOAA National Ocean Service, NOAA Coastal Ocean Program, NOAA National Severe Storms Laboratory, U.S. Geological Survey, Federal Emergency Management Agency, U.S. Army Corps of Engineers, and U.S. Coast Guard. The Consortium has worked with the following state agencies during the reporting period: S.C. Department of Health and Environmental Control, SCDHEC/Office of Ocean and Coastal Resource Management, S.C. Department of Natural Resources, S.C. Department of Parks, Recreation and Tourism, S.C. Emergency Preparedness Division, Palmetto Pride, and the S.C. State Ports Authority. Other organizations include: numerous counties, cities, towns, and councils of government, S.C. Marine Educators Association, S.C. Coastal Conservation League, S.C. Downtown Development Association, S.C. Marine Association, S.C. Nature-Based Tourism Association, S.C. Aquaculture Association, Extension Disaster Education Network, Beaufort Water Quality Task Force, coastal Chambers of Commerce, Lowcountry Seafood, Inc., African-American Heritage Council, 113 Calhoun St. Foundation, Charleston Area Project Impact, Donlar Corporation, South Carolina Aquarium, Duke Power Company Foundation, Springs Industries, Lockheed Aeronautical, Inc., BMW Manufacturing Corp., Charleston Homeownership Center, BP Amoco Chemicals Company, Ben & Jerry's Charleston, Cisco's Café, Marine Terminals, The City Marina, and Sonoco Products, Inc.

3.2. Identification of Customer Needs

The S.C. Sea Grant Consortium is structured to optimize communication and feedback linkages necessary for the proper development, implementation, and delivery of its programs.

In addition to its Board of Directors, Institutional Liaisons provide a direct administrative link between the Consortium and each of its member institutions. Each Institutional Liaison provides a channel of communication on matters dealing with the proposal process, processing of grants and awards, and oversight of ongoing projects and programs. In addition, the Consortium's *External Procedures Handbook: A Faculty and Institutional Guide for Consortium Proposals and Projects*

provides documentation on the administrative processes the Consortium employs in managing its extramural programs, and is made available to faculty and staff at the Consortium's member institutions. It is presently under review and will be revamped in the next reporting period as we adapt to constituents' needs and further develop Web-based ways to do business with our researchers and stakeholders. The revision was delayed due to the rapid and ongoing changes in communications technology, which have significantly changed the way the agency does business.

Program Area Advisory Groups are convened as needed to provide assistance in long-term planning, technical quality, and identification of available expertise in the Consortium's nine strategic program areas.

The S.C. Sea Grant Consortium maintains direct and frequent contact with coastal and marine user groups and the general public, and serves as a conduit between institutional knowledge-seekers and coastal and marine knowledge-users, through its S.C. Sea Grant Extension Program (SGEP) and Communications and Information Services (CIS) activities. These outreach programs assure that (1) problems and needs of those who live and work along the coast are accurately identified, (2) research projects and programs are effectively providing the necessary science-based information, and (3) this information is delivered to target audiences in a timely fashion and "user-friendly" format. Further, these users play an active role in the ongoing process of refining our strategic plan to meet the changing needs of our constituencies. The overarching goal of the strategic planning process is to maximize the ability of the Consortium's research, education, and outreach programs to address the coastal resource needs and opportunities of South Carolina and its citizens.

3.3. Listening and Learning

Several internal mechanisms have been established by the Consortium to facilitate a programmed team approach to address coastal and marine resource issues and constituency needs. As previously mentioned, the Consortium's Core Group supports communication and information exchange among the Consortium's internal program components – staff members of the Core Group represent program policy, program development, program management, extension services, communications, and administration. Meetings, held on a monthly basis, help ensure efficient and effective program component interaction. Using a team approach, the Core Group develops and coordinates Consortium programs and activities.

The Consortium's staff continues to enhance the SCSGC Web site (www.scseagrant.org) by expanding its interactive features, making the site more assessable to people with disabilities, and keeping the information up-to-date and relevant. Nevertheless, traditional means of communication are still extremely important for information delivery; the Consortium's communications staff produced over 75 publications in FY02-03, which informed our constituents about coastal issues and, where appropriate, facilitated the transfer and exchange of information.

In addition to its strategic planning process, the Consortium utilizes other means to better enable it to identify and communicate with constituent groups and their needs. It does this through interaction with members of the Board of Directors; liaisons at the Consortium's member institutions, Blue Ribbon Committees; its Sea Grant Extension Program specialists; and its Communications and Information Services staff.

Category 4 – Information and Analysis
4.1-4.4

4.1. Evaluation of Consortium Proposals and Programs

The primary focus of the Consortium's information and analysis process is the evaluation of how well research and outreach proposals address the mission, goals, and priorities of the agency, as laid out in the agency's strategic plan and specified in its biennial Request for Proposals (available on the agency's Web site and in hard copy format to all Consortium member faculty and staff).

4.1.1. Proposal Review Process

All research, education, and outreach proposals received by the Consortium go through a rigorous scientific review process. The FY04-06 RFP process began April 11, 2003 for our biennial "Program Plan to the National Sea Grant College Program Office." The proposal process began with the submission of "concept letters" (preproposals) by Consortium institutional faculty and staff. A technical and management review panel was convened June 4, 2003, to assist Consortium staff in determining the relative merits of the concept letters and identifying which concept letters were worthy of further development into full-length proposals. Criteria used in this review are based on priorities established within each of the nine strategic goals established in our 2002-2003 planning process. On August 25-26, 2003, a technical review panel was convened to review and rate the full proposals. During this review, a panel of scientists, who in the aggregate have the expertise necessary to analyze all proposals submitted for funding consideration, discuss and rate the proposals based upon their technical and scientific merit and on Consortium priorities as identified in the Request for Proposals. The Consortium's National Sea Grant Office program monitor participates as an ex-officio member of the panel as well. Input from the panel, as well that provided in written peer reviews (see below), is then used to guide the final decision process, which is the responsibility of the Agency Head, with input provided by the Consortium's Core Group and in consultation with the National Sea Grant Office. The results of the selection process will be completed by November 15, 2003, and federally approved projects will commence March 1, 2004.

When full proposals are received, the Consortium distributes them to scientists and experts nationwide to seek *written peer reviews*. Agency staff maintains a database of experts in all scientific fields relevant to the diverse range of research and outreach projects the Consortium considers for funding. Those experts are called upon to evaluate proposals that fit within their areas of expertise. The objective of this review process is to obtain at least three detailed, written reviews of every proposal to guide the Core Group in making recommendations to the Agency Head. As an aside, development proposals (called "seed projects") are also evaluated by the Core Group with the aid of written peer reviews.

On occasion, formal technical panels are convened to review major, multi-institutional research and outreach efforts, such as the Land Use-Coastal Ecosystem Study (LU-CES) and the USGS Coastal Erosion Study.

4.1.2. Conflict-of-Interest

Another important feature of the Consortium's review process is its Conflict of Interest Policy, which is designed to protect the integrity of all proposal writers and peer reviewers. The policy requires that potential reviewers recuse themselves if they have (1) a major professor/student relationship with the Principal Investigator (PI), (2) published with the PI in the last five years, (3) been a colleague of the PI in the same academic department or served directly or indirectly in a supervisory role over the PI in the last year, (4) grants, contracts, or any financial interest with a PI, and/or (5) a relationship (by blood or by marriage) to the PI.

4.2. Consortium Management Information System

The Consortium's Management Information System (CMIS) is a Windows-based platform utilizing Microsoft Access as its database. CMIS addresses one of the Consortium's major management objectives – the evaluation of organizational performance against goals and standards. It is organized into ten database files (Sea Grant Projects, "Seed" Projects, Other Projects, Graduate Students, Fellows, Peer Reviewers, Reprints, Publications, Books, and Workshops); data are updated and revised regularly.

Ultimately, our efforts will permit the Consortium's Management Information System to become more fully Web-based and more accessible to Consortium-funded researchers and other stakeholders. In the immediate future, the new Access database will be further refined to facilitate querying and generating actionable management reports.

4.3. Internal Decision-making

Several internal mechanisms have been established by the Consortium to facilitate a programmed team approach for decision-making. For example, the "Core Group" supports communication and information exchange among the Consortium's internal program components. Staff members of the Core Group represent program policy, program development, program management, extension services, communications, and administration. Meetings, held on a monthly basis, help ensure efficient and effective program component interaction and analysis of programs and activities. Using a team approach, the Core Group develops and coordinates Consortium programs and activities.

Other mechanisms established by the Consortium include internal task groups to deal with information technology, the Consortium's Web site, mailing lists, and the Consortium Management Information System (CMIS).

The Consortium's *Internal Procedures Handbook: A Staff Guide for Consortium Operations, Proposals, and Projects* will be updated during the next reporting period. The handbook details programmatic and administrative policies for use by all Consortium staff.

4.4. Fiscal Analysis

Finally, fiscal responsibility is the keystone of any state agency because of its fiduciary responsibility to the state's citizens and to the taxpayers it serves. The Office of the State Auditor has not yet scheduled the Consortium's next accounting and procurement practice audit, which would cover the fiscal year ending June 30, 2002. The agency's fiscal year 2001 audit concluded that there were no exceptions to the Consortium's accounting procedures, and its procurement practices were found to be very satisfactory. The Consortium's Assistant Director is responsible for the financial well-being of the agency on a day-to-day basis.

Category 5 – Human Resource Focus

5.1-5.6

5.1. Employee Motivation

Consortium managers formally meet with their staff on a monthly or quarterly basis. Employees are encouraged to participate in these meetings and to voice their opinions and ideas that may improve their efficiency and that of the agency. Employees are also strongly encouraged to join state, regional, and national organizations to enhance their professional development, further develop and sharpen their skills and knowledge, and build leadership capabilities. Each staff member is given the opportunity to, at least once a year and if funds are available, attend a workshop or conference of their choice to enhance his/her job performance and build professional skills.

5.2. Development and Training Needs

The S.C. Sea Grant Consortium is a small agency and many of its employees wear more than "one hat." Therefore, in many instances, employees must be cross-trained to be able to perform job functions in more than one program division (administration, communications, education, program research, program development, and extension services) of the office. New employees are given an overview of the agency policies and procedures during the interview stage, and the agency's personnel manual and Internal Procedures guide are made available for their use. New employees are also oriented by the agency's Assistant Director. Employees, as stated before, are informed of training and professional development opportunities to enhance their job skills and knowledge through training at the state, federal, and/or national levels.

5.3. Employee Evaluation

Employees are not only rated annually through the Employee Performance Management System, but are assessed throughout the year to keep their performance level as high as possible. They are encouraged to talk to their manager any time they have questions, problems, or concerns. Employees are encouraged to bring their ideas and/or problems to their supervisor, whether it is within their division or agency wide. If their supervisor cannot help with their problems or are unable to give them adequate guidance, they are encouraged to talk to the Assistant Director or to the Agency Head, if necessary. The agency finds that these open line of communication foster enhanced performance and helps to promote idea-sharing, enhance teamwork, and problem-solving.

5.4. Assessment Methods

Monthly or quarterly meetings with and among employees within and across agency divisions are held regularly. In addition, the Agency Head chairs a monthly Consortium staff meeting in which employees share their accomplishments and needs, and inform agency staff of what is going on within their programs. These meetings help agency managers assess employee problems and successes. Additionally, the Agency Head and agency managers are in constant communication and contact with all agency staff on a daily basis ("managing by walking around"), and use these opportunities to assess staff morale, provide "attaboys," and encourage excellence. This provides

direct and constant means by which agency managers can determine whether employees are motivated and satisfied with their work and working conditions.

5.5. Community Involvement

The Consortium and its staff are directly involved with the community. The agency is a member of the Trident and South Carolina Chambers of Commerce, and many other community-based organizations and institutions. The agency is an active participant in the state's United Way campaign. Two (of many) Consortium programs that are representative of the agency's involvement with the community are the Beach Sweep/River Sweep volunteer marine litter control program and the 113 Calhoun Street Sustainability project (see Category 7). A listing of the community groups, organizations, institutions, businesses, industries, and public interest groups with which the Consortium and its staff are engaged can be found in Category 3.

Initiated in 2000, each Christmas, individual staff members pool their money and contribute a donation, in the name of the S.C. Sea Grant Consortium, to the Charleston *Post & Courier* newspaper's "Good Cheer Fund" for the needy. Last year employees contributed over $200 to the fund.

Category 6 – Process Management

6.1-6.4

6.1. Product/Service Design and Delivery

While the Consortium has always made it a priority to focus its process management around the needs of its constituencies, there are always opportunities for improvement, particularly in the Internet Information Age. The Consortium's staff continues to upgrade the agency's Web site (www.scseagrant.org) by enhancing its interactive features, making the site more assessable to people with disabilities, and keeping the information current. The Web site features an array of information about coastal and marine issues for scientists, educators, students, business and industry, and the public.

The site offers Web pages about Sea Grant research, extension, and educational activities. It includes current and back issues of the periodicals *Coastal Heritage* and *Inside Sea Grant*, frequently updated information about ongoing projects such as Beach Sweep/River Sweep and 113 Calhoun Street: A Center for Sustainable Living, and links to other research and educational institutions. The Flash software employed on the site allows the Consortium to create interactive educational activities for students and other users.

In addition to being well-received by the public and our various stakeholders, the Web site has made doing business with the Consortium more convenient for our institutional faculty and staff. The Consortium is transitioning both its research/outreach proposal application process and project reporting from hard copy to electronic.

The goal of the Consortium's communications department is to place information produced by the agency's research, education, and extension activities into the hands of those who manage and use South Carolina's coastal and marine resources. To facilitate that effort, a "S.C. Sea Grant Consortium Communication Support Guidelines" booklet is now in use. The guide advises Sea Grant-sponsored investigators, extension specialists, and others of the procedures and opportunities available for publication and dissemination of information derived from their work.

Program Area Advisory Groups are convened as needed to provide assistance in programmatic matters, while Institutional Liaisons provide a direct administrative link between the Consortium and each of its member institutions. Each Institutional Liaison provides a channel of communication on matters dealing with the proposal process, processing of grants and awards, and oversight of ongoing projects and programs.

6.2. Meeting Key Performance Requirements

The principal investigator of a Sea Grant project is responsible for all technical reporting and, in conjunction with the institutional business office, all fiscal reporting to the Consortium. In turn, the Consortium is responsible for technical and fiscal reporting to its funding agencies. Consortium professional staff frequently visits with investigators on campus to discuss project progress and needs. The investigator must submit formal requests for budget changes, time extensions, and changes in project scope to the Agency Head, through the institution's Office of Sponsored Programs, at least 60 days prior to the end of a grant period.

The Sea Grant fiscal year begins March 1 with the formal award announcements mailed to the investigator. Under separate notification, the respective institution's business office is provided with two copies of the Consortium Award Agreement, which must be read, agreed to, and endorsed by the appropriate signatory authority and the P.I. The institution must then forward one copy of the signed original back to the Consortium for its records.

Permanent equipment purchased under a Consortium project is and remains the property of the Consortium, but can remain with the investigator's institution. The Consortium does reserve the right to transfer use of this equipment upon completion of the project. However, there are provisions for the investigator and/or institution to obtain title to equipment. Final disposition of the equipment will be determined under existing statutes.

In addition to the Agreement, fiscal reporting forms that reflect the approved budgets are mailed to investigators and their respective institutional fiscal officers. The "Federal and Match Expenditure Report**"** is used to reflect expenditures and is sent quarterly to the Consortium's Assistant Director by the institutional business office, with the appropriate endorsement.

The policy and procedures set forth in the DOC regulations (37 CFR 401), "Rights to Inventions made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts, and Cooperative Agreements," published in the Federal Register on March 18, 1987, apply to all grants and cooperative agreements made for which the purpose is experimental, developmental, or research work. The Consortium's Assistant Director receives with the final expenditure report a completed "Final Invention Statement" if any patents were developed during the course of the project.

There are three categories of program technical reports required by the Consortium:

1. "Progress Report," prepared by the Consortium staff (with input provided by the principal investigators) 90 days prior to the end of a project year, that briefly summarizes project progress for the current effort;
2. "Annual Reports," prepared by the principal investigators, summarizing annual progress of a project which is proposed for continuation; and
3. "Final Reports," prepared by principal investigators at the end of a project, providing a concise summary of results of the entire project.

These reports are used to ensure that the projects are achieving their stated goals within the timeframes and budgets established for them. Furthermore, the reports form the basis for reporting accomplishments in the State Accountability Report as well as the annual National Sea Grant Office Progress Report. The reports also provide documentation that is useful in preparing for the Consortium's performance assessment by the National Sea Grant Office every four years.

Annual and Final Reports are due at the Consortium office 30 days after the project year ends.

Final reimbursement to the institutions may not be made until the Project Report is received and deemed acceptable by the Consortium office.

7.1. Program Support - FY02-03

7.1.1. Consortium Funding - Current Status

For the reporting period, the Consortium received $5,385,300 in non-state funding, a $195,600 decrease from FY00-01. Overall, the Consortium's total annual budget for FY02-03 was $5,885,200, 3.6% less than that of FY01-02.

State appropriations account for only 8.3% of the total, down slightly from 9.1% in FY01-02. State budget cuts over the past two years resulted in a reduction of the Consortium's recurring state budget from $650,000 in FY00-01 to $499,900 in FY02-03 (rounded to nearest thousand). This cut represented a 23% decrease in the Consortium's recurring state budget, which has had a huge impact on the agency. The Consortium will experience difficulties in maintaining current productivity levels and providing excellent service to our constituents if cuts of this magnitude continue to be required.

The S.C. Sea Grant Consortium has been very effective in securing non-state funding in support of its strategic program areas around which it organizes its research, education, and extension activities. Budget trends covering the period 1988-2003 are found in Table 7.1-5A and Figure 7.1-5A. The sources of funding for the current fiscal year (02-03) are shown in Figure 7.1-5B. Budget trends for the period 1997 through 2003 are shown in Figure 7.1-5C.

Figure 7.1-5 A. Year-to-year comparisons of SCSGC funding by sources.

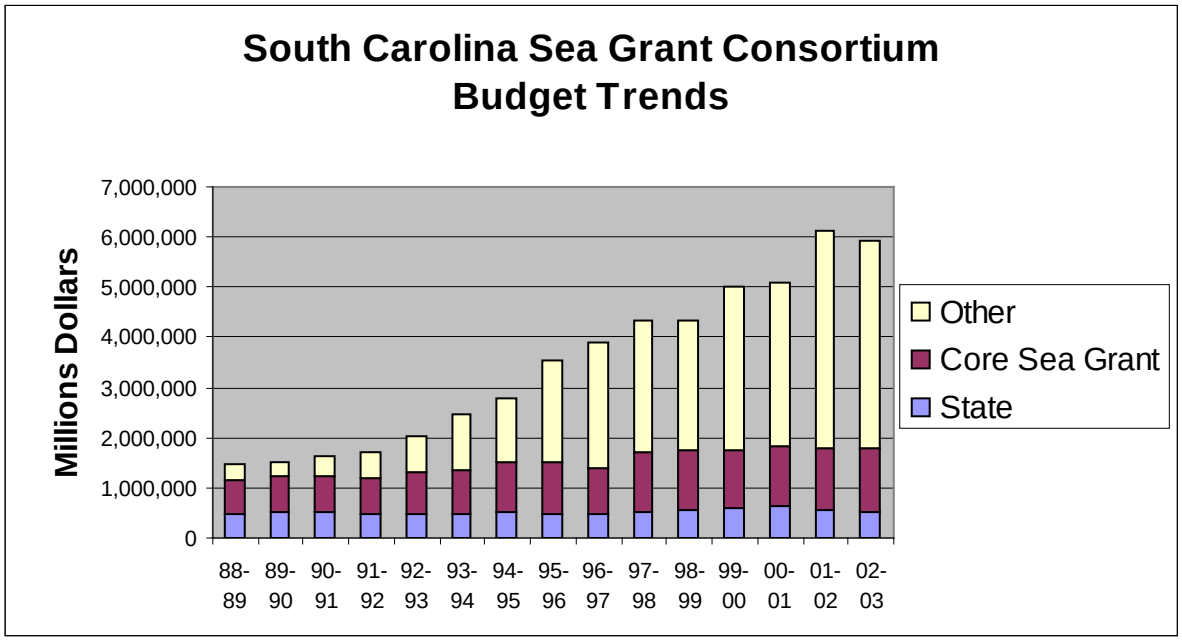


Figure 7.1-5 B. Breakout of SCSGC 2002-03 budget.

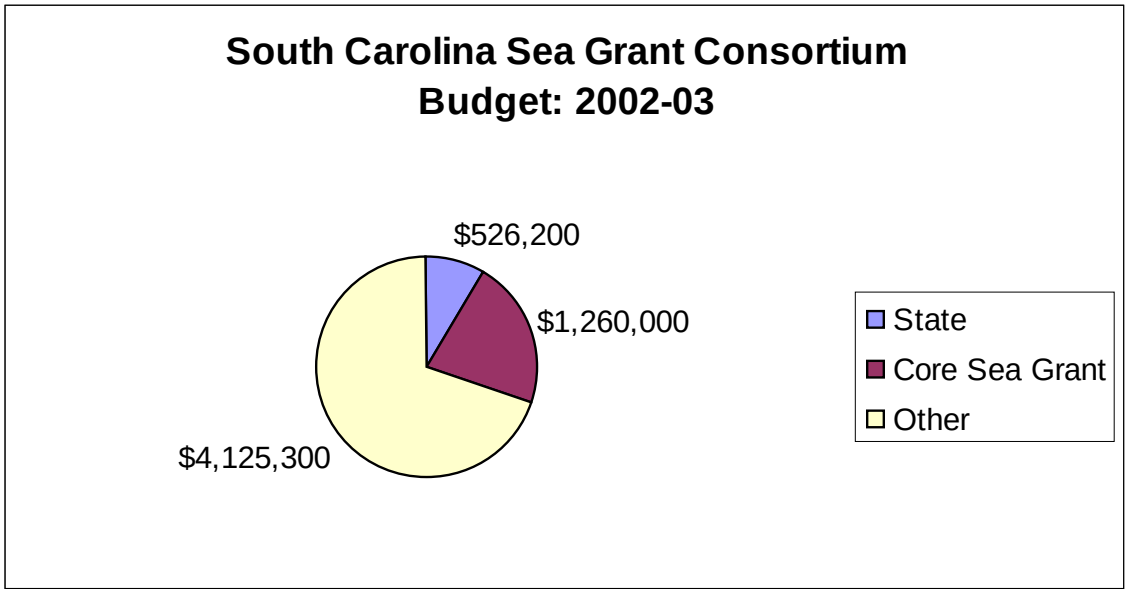


Figure 7.1-5 C. Five-year budget trend, fiscal 1998 through 2003.

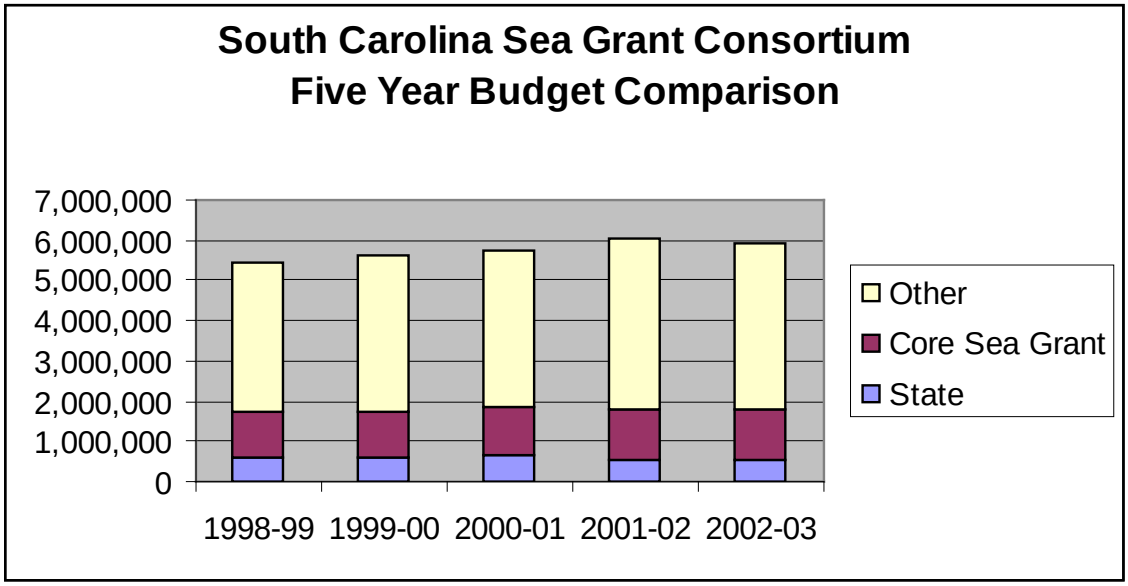


Table 7.1-5 A. Annual SCSGC budgets by funding source.

South Carolina Sea Grant Consortium

BUDGET TRENDS 1988-2003

(As of January 3, 2003)

Year	State[1]	Core Sea Grant	Other[2]	Total
1988-89	$483,100	$659,300	$339,400	$1,481,800
1989-90	510,400	705,000	310,300	1,525,700
1990-91	518,100	725,000	386,200	1,629,300
1991-92	492,100	705,000	497,000	1,694,100
1992-93	482,400	845,000	705,300	2,032,700
1993-94	490,900	845,000	1,123,400	2,459,300
1994-95	503,900	1,015,000	1,283,100	2,802,000
1995-96	487,400	1,015,000	2,033,000	3,535,400
1996-97	496,500	896,500[3]	2,498,800	3,891,800
1997-98	528,300	1,169,000	2,654,500	4,351,800
1998-99	575,200	1,169,000	2,597,100	4,341,300
1999-00	591,500	1,169,000	3,252,400	5,012,900
2000-01	650,800	1,191,200	3,259,700	5,101,700
2001-02	544,400	1,254,000	4,326,900	6,125,300
2002-03	499,873	1,260,000	4,125,300	5,885,200

Note: Figures do not include institutional cost shares.

[1] State appropriations include B&CB-mandated reductions and B&CB adjustments such as BPI, FB, bonus and annualizations. [2] Other funds include support provided by local, state, federal (other than core Sea Grant) and private sources. [3] Reduced Sea Grant core funding due to a six-month administrative budget as per National Office transition of grant start dates.

7.1.2. Consortium Funding - Coming Year

At the state level, it appears the Consortium's state appropriation will be reduced from $499,873 in FY02-03 to $440,505 for FY03-04, an additional 12.19% (= $59,368) reduction. This reduction consists of making permanent the third-quarter reduction of 3.73%, and reducing further the Consortium's budget by an additional 8.46%. For non-state funding, The President's budget submitted to the U.S. Congress at the beginning of this year, the National Sea Grant College Program is proposed for funding at $57.4 million. (The current FY03 budget for National Sea Grant is $60.4 million.) As of this reporting period, no formal appropriations marks have yet to emerge from either the House or Senate Appropriations Committees.

7.2. Personnel and Administration Overview

The Consortium's fourteen full-time equivalents are evenly divided among the Consortium's Outreach, Program Administration, and Program Management activities (Figure 7.1-5D). Of these FTEs, 8.33 are state slots, and 5.67 are Federal slots. The total number of Consortium's FTEs has remained relatively constant over time, even though the Consortium's activities have significantly expanded.

While the Consortium's programmatic activities continue to increase, administration costs remained level over time until the present state fiscal difficulties and budget cuts. Administration costs for the period 2001-02 decreased 15 percent compared to FY00-01; 8 percent 2002-2003 compared to FY01-02. Since 2000-01, the Consortium has had to absorb severe budget reductions, thus, administration costs have decreased by 20 percent (Figure 7.1-5 E). This trend will have adverse affects on our ability to serve South Carolina's coastal needs, particularly so at a time when the state is experiencing exponential growth and development in its coastal communities. The need has never been greater to apply science to coastal imperatives.

Figure 7.1-5 D. SCSGC full-time equivalents by function. Over a three-year period Equivalents have remained the same.

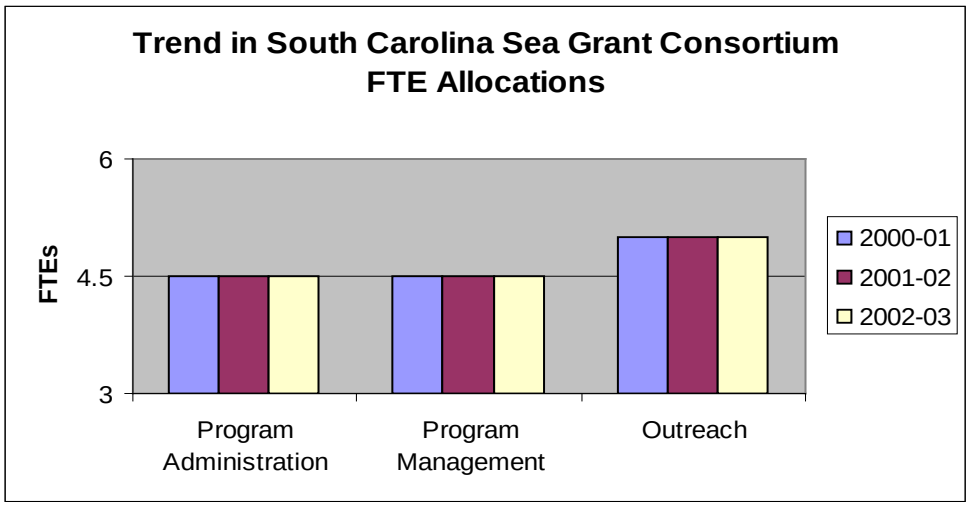
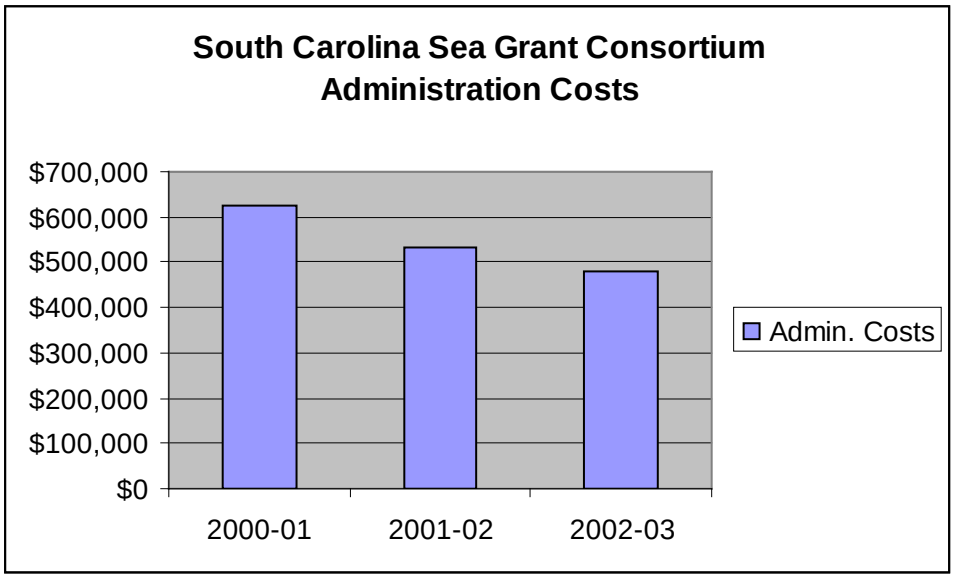


Figure 7.1-5 E. Comparison of current period administration costs to previous years.



7.3. Consortium Program and Project Summary - FY02-03

7.3.1. Overview

The Consortium received $1,260,000 in Sea Grant core funding to support 15 research and education projects, its program management and development activities, its Communications and Information Services program, and the S.C. Sea Grant Extension Program (managed jointly by the Consortium and Clemson Cooperative Extension Service).

Of that total, the Consortium received $125,000 from the National Sea Grant Office as merit funding as a result of the National Sea Grant Program Assessment Team evaluation process, which rated the S.C. Sea Grant Consortium as "excellent." (See page 3.)

The Consortium continues to seek and receive funding from a number of non-state sources. Funding was secured from the NOAA Coastal Ocean Program for the Land Use-Coastal Ecosystem Study (LU-CES; $1.2 million) and the Urbanization and Southeastern Estuarine Systems program (USES; $682,900), the NOAA National Ocean Service for FISHTEC ($388,500), and the U.S. Geological Survey for the SC/GA Coastal Erosion Study ($500,000).

7.3.2. Program Grants 2002-2003 Update

The S.C. Sea Grant Consortium competed for and secured the following coastal and marine research, education, and extension grants from non-state sources:

7.3.2.a. Program Management, Research and Outreach

- "S.C. Sea Grant College Core Program" - NOAA National Sea Grant College Program - $1,135,000 - March 1, 2003 to February 28, 2004 (continuing) - M. Richard DeVoe (S.C. Sea Grant Consortium).

- "S.C. Sea Grant College Program - Merit Funding" - NOAA National Sea Grant College Program - $125,000 - March 1, 2003 to February 28, 2004 (Year 4 of 5) - M. Richard DeVoe (S.C. Sea Grant Consortium).

- "National Sea Grant Knauss Marine Policy Fellowship Program" - NOAA National Sea Grant College Program - $38,000 - February 1, 2003 to January 31, 2004 - M. Richard DeVoe (S.C. Sea Grant Consortium) – [College of Charleston]

- "Sea Grant Abstracts" - NOAA National Sea Grant College Program - $98,952 - March 1, 2003 to February 28, 2004 (Continuing) - F. Shephard (WHOI).

- "Support for Beach Sweep/River Sweep '03 Activities" - Private Donations - ~$20,000 - September 2003 – Susan Ferris (S.C. Sea Grant Consortium).

7.3.2.b. Coastal Ocean Studies

- "South Atlantic Bight Land Use - Coastal Ecosystem Study (LU-CES)" - NOAA Coastal Ocean Program Office - $1,200,000 - July 1, 2002 to June 30, 2003 (Year 2 of 5) - M. Richard DeVoe (S.C. Sea Grant Consortium).

- "Urbanization and Southeastern Estuarine Systems (USES)" - NOAA Coastal Ocean Program - $682,900 - August 1, 2002 to July 31, 2003 (Year 13 of 14) - F. John Vernberg (University of South Carolina).

- "Southeast Atlantic Coastal Ocean Observing System – Initial Implementation" – Office of Naval Research (through the University of North Carolina – Chapel Hill) - $29,500 – September 1, 2002 to August 31, 2003 (Year 1 of 4) – M. Richard DeVoe (S.C. Sea Grant Consortium).

7.3.2.c. Ecosystem Dynamics

- "Molecular and Pathobiology Studies to Identify the Causitive Agent of Juvenile Oyster Disease" - NOAA National Sea Grant College Program - $95,422 - October 1, 2002 to September 30, 2003 (Year 2 of 2) - Cheryl M. Woodley and Eric R. Lacy (Medical University of South Carolina).

- "A Proposed Harmful Algal Bloom Initiative for South Carolina: Assessing the Potential Impacts of Red Tides, *Pfiesteria*, and Toxic Algae" – S.C. Department of Natural Resources - $25,390 - October 1, 2002 to September 30, 2003 (Year 2 of 3) – M. Richard DeVoe (S.C. Sea Grant Consortium).

7.3.2.d. Climate and Hazards

- “Establishing the Operational and Management Functions of 113 Calhoun Street: A Center for Sustainable Living” - NOAA/NOS Coastal Services Center - $90,000 - September 1, 2000 to August 31, 2003 (Year 1 [Extended] of 1) - M. Richard DeVoe (S.C. Sea Grant Consortium).

- "SC/GA Coastal Erosion Study - Phase II" - U.S. Geological Survey - $500,000 - September 1, 2001 to August 31, 2003 (Year 3 of 5) - M. Richard DeVoe (S.C. Sea Grant Consortium).

- "National Sea Grant Coastal Hazards Theme Team" - NOAA National Sea Grant College Program - $15,000 - March 1, 2003 to February 28, 2004 (Year 4 of 4) - M. Richard DeVoe (S.C. Sea Grant Consortium).

7.3.2.e. Marine Biotechnology

- "Cooperative Program in Fisheries Molecular Biology (FISHTEC)" - NOAA National Ocean Service - $388,500 - September 1, 2002 to August 31, 2003 (Year 10 of 12) - M. Richard DeVoe (S.C. Sea Grant Consortium).

7.3.2.f. Sustainable Economic Development

- “Development of Reliable Spawning, Nursery, and Juvenile Production Techniques for Commercialization of Black Sea Bass Aquaculture” - NOAA National Sea Grant College Program - $137,100 - September 1, 2002 to August 31, 2003 (Year 2 of 2) - Theodore I.J. Smith (S.C. Department of Natural Resources).

- “Engineered Ecosystems for High Rate Sustainable Marine Shrimp and Bivalve Production” - NOAA National Sea Grant College Program - $70,010 - September 1, 2002 to August 31, 2003 (Year 2 of 2) - David E. Brune (Clemson University).

- “Development of Cobia Culture in the United States” - NOAA National Sea Grant College Program - $28,531 - September 1, 2002 to August 31, 2003 (Year 2 of 2) - Theodore I.J. Smith (S.C. Department of Natural Resources).

- “Addressing the Challenges of Coastal Growth in South Carolina: A S.C. Sea Grant Consortium Initiative” - NOAA National Sea Grant College Program - $50,000 - March 1, 2003 to February 29, 2004 (continuing) - M. Richard DeVoe (S.C. Sea Grant Consortium).

- “S.C. Sea Grant Fisheries Extension - FISHTECH Outreach” – NOAA National Sea Grant College Program - $42,785 – July 1, 2002 to June 30, 2003 (Year 1 of 1) – M. Richard DeVoe (S.C. Sea Grant Consortium).

- “South Atlantic Regional Fisheries Extension Enhancement Work Plan - South Carolina” – NOAA National Sea Grant College Program - $15,000 - July 1, 2002 to June 30, 2003 (Year 1 of 1) – M. Richard DeVoe (S.C. Sea Grant Consortium).

7.3.2.g. Marine Education

- "SG-MSI Partnership Program: Strategic Partnership to Enhance Experiential Learning in Marine Sciences" - NOAA National Sea Grant College Program - $45,000 - October 1, 2002 to September 30, 2003 (Year 3 of 3) - Donald I. Anadu (South Carolina State University).

- "Southeastern Center for Ocean Sciences Education Excellence: A Systematic Approach to Forming Ocean Science Education Partnerships" – National Science Foundation (with partial funding provided by the National Oceanic and Atmospheric Administration) - $294,136 – September 12, 2003 to August 31, 2003 (Year 1 of 3) – Lundie Spence (S.C. Sea Grant Consortium).

7.3.2.h. Training and Outreach

- "Implementation of a Nonpoint Education for Municipal Officials Program" - S.C. Department of Health and Environmental Control - $60,070 - July 1, 2002 to June 30, 2003 (Year 3 of 3) - M. Richard DeVoe (S.C. Sea Grant Consortium)

7.4. Consortium Program Results - FY02-03

During the reporting period, the Consortium administered research, education, and extension projects involving 115 grant actions – a **19% increase** in activity compared to the FY01-02 period. This number does not include grant administration activity associated with ongoing research projects. It is important to point out that moving forward, the Consortium's resources are being stretched thin by state budget cuts, while its level of activities and community involvement continue to grow robustly.

Consortium support was provided to many faculty and staff, as well as post-secondary students, at our eight member institutions. Between July 1, 2001 and June 30, 2002, Consortium educational programs reached approximately elementary teachers and approximately 700 elementary students. Consortium communications produced 75 publications (up from previous year), ranging from extension manuals to technical reports. From July 1, 2002 through June 30, 2003, the Consortium responded to requests for 1,643 Sea Grant publications.

This year, the Consortium secured a grant to establish and operate the SouthEast Center for Ocean Sciences Education Excellence, which is one of seven, regional centers funded through the National Science Foundation, with additional funding from NOAA Office of Ocean Exploration and NOAA Coastal Services Center. SouthEast COSEE is administered through the South Carolina Sea Grant Consortium, and is funded under a three-year award at $300,000 per year.

7.4.1. Research and Education

7.4.1.a. Sea Grant Core Research and Education Efforts

The S.C. Sea Grant Consortium organizes its core Sea Grant research and education efforts into nine strategic program areas, within which the following projects were supported by Sea Grant core funding.

Coastal and Ocean Processes

R/CE-5 "Nearshore Impacts of Offshore Dredging for Beach Nourishment" – P. Work (Georgia Tech) – Folly Island is scheduled for renourishment in the near future, as well as the construction of a "groin." In order to minimize transport costs of sand, it is desirable to locate the borrow pit as close as possible to the final destination. If sited too close to the project site, however, the borrow pit can negatively impact the beach, through a variety of mechanisms, particularly wave transformation. Based on available geophysical data and past experience, several borrow pit configurations at Folly Island were studied. The most promising was tested in detail through the application of numerical models (SWAN; GENESIS) for waves and currents to simulate changes in shoreline position likely to occur over a one-year period. The test borrow pit, located near the 8 m depth contour near the south end of Folly Island, showed that negative impacts of the dredging project are predicted to be negligible. The model results also reproduced the major erosion and accretion features of the island, including the region known as "The Washout." The methodology using three different numerical successfully reproduced the major features of the long-term (one year) shoreline change on Folly Island, and the methodology could similarly be applied at any site where the beach is comprised of non-cohesive sediments and the shoreline change is driven primarily by breaking waves.

R/CP-11 "Towards Quantifying Coastal Erosion in South Carolina: Offshore Shoals as Sediment Sinks and Controls for Shoreline" – G. Voulgaris (University of South Carolina) – This work is providing a better understanding of regional sediment dynamics critical for long-term coastal planning and engineering design purposes. Beach replenishment projects, construction of groins, seawalls and other soft and hard coastal engineering structures aim at restoring recreational beaches. Prevailing conditions (e.g., tides, currents, and winds) in these areas may be influenced by offshore topography and sediment availability. The objective of this study is to examine the relationship between an offshore shoal in the Myrtle Beach area and coastal erosion dynamics. The end goal is to characterize and quantify the potential for the shoal to be a sustainable borrow site for this economically important resort community. Specific objectives are to: (1) identify the effect of tidal and wind forcing around the shoal; (2) identify the effect of the shoal in controlling wave propagation and its role in "energetic events" (such as storms); (3) model the propagation of gravity waves for the prediction of wave characteristics; and (4) model coastal circulation over the shoal.

Ecosystem Dynamics

R/ER-19 – "Linkages Between Cellular Biomarker Responses and Reproductive Success in Oysters and Mussels" – A. Ringwood (SCDNR – Marine Resources Research Institute) –The research has developed new and innovative ways of testing and validating promising cellular biomarkers. This research has the potential to yield tools that will identify individuals and populations experiencing chronic stress. The value lies in the ability to detect early warning signs so that mitigation efforts may be employed to prevent severe effects at the population and ecosystem levels.

R/ER-20 – "Succession of Tidal Freshwater Wetlands on the Cooper River, S.C.: Ecological Functions and Management" – J. Morris *et al.* (University of South Carolina, The Citadel, SCDNR-Freshwater Fisheries and Wildlife) – The researchers are engaged in determining best management alternatives for former rice field impoundments along the Cooper River. The habitats in these former rice fields are changing rapidly from open water fields to dense fields of cattails and other aquatic plants. The researchers have qualified the ecological values of different habitats in order to understand the ecological costs and benefits of different management practices. For example, fish habitat has been found to be better in fields that are maintained in an open state. Researchers have argued that the best course of action is to achieve a mixture of habitat types in order to maximum biodiversity and maintain a variety of ecosystem functions. Several meetings have been held with local interest and government agency groups to discuss the findings, and a special session on the ecological values of impoundments was held at the 2001 international meeting of the Estuarine Research Federation.

R/ER-21 - Development of a Cross-Linked Copepod Life-Cycle and Molecular-Genetic Assay for Examining Exposure and Effects of Coastal Use Insecticides – J. Staton (University of South Carolina) -An acute toxicity test with an LC_{95} concentration of fipronil was performed on *Amphiascus tenuiremis* to determine if a small cohort of individuals could survive and be cultured for future toxicity testing and genetic analysis of fipronil resistance. In addition, a full life-cycle microplate bioassay with *A. tenuiremis* has been developed to test for sublethal effects of a suite of pesticides, including fipronil. This bioassay method will be helpful in determining if *A. tenuiremis* displays any genetic resistance to fipronil. Individuals from the fipronil-exposed cultures have been collected for genetic analysis in order to compare their $GABA_A$ beta-like receptor gene sequence to that of non-exposed individuals. At this time, we have successfully isolated a $GABA_A$ beta-like receptor fragment from cDNA and are currently cloning and sequencing additional fragments to increase replication and to gain a more detailed picture of the gene. This information will allow us to use PCR techniques to amplify the $GABA_A$ beta-like receptor gene from individual *A. tenuiremis* and compare genetic variation between exposed and non-exposed populations leading to its use as a potential biomarker of exposure in the wild.

R/ER-22 – "A Novel Foraminiferal-Based method to Determine Sublethal Toxicological Risks of Metal Mixtures in Estuarine Sediments" – T. Shaw (University of South Carolina) – Exposure-toxicity risk assessment tools are being developed based on the bioaccumulation of heavy metals in the foraminiferan *Ammonia becarii* and concordant toxic response of the common copepod, *Amphiascus tenuiremis*. During the reporting period researchers collected and analyzed samples from field and laboratory microcosm cultures. Results from field cultures confirm our model for bioaccumulation and exposure risk based on lead isotope data. Exposure is confirmed in foraminifera shells as anthropogenic lead isotopic signatures. Additional results from isotope based feedings studies on laboratory cultures are elucidating pathways of heavy metal uptake into the organisms.

R/ER-23 – "Groundwater-Derived Nitrogen and Phosphorous Inputs to the Satilla River Estuary: Impact on Coastal Ecosystem Health" – W. Moore (University of South Carolina) The serious decline in coastal water quality and ecosystem health resulting from coastal development is under study. Development increases anthropogenic wastes, leading to eutrophication and resulting

ecological damage, such as fish kills and harmful algal blooms. In order to assess anthropogenic effects, natural processes must be quantified. We are working to quantify the flux of nutrients to the Satilla River from groundwater sources and to determine if the fluxes are natural or anthropogenic. The techniques developed from this study should be relevant to other coastal systems. The work will provide answers to basic questions about factors that impact coastal ecosystem health.

Coastal Natural Hazards

R/CE-6 Determination of Hurricane Wind Loads and Wind Effects – T. Reinhold (Clemson University) Technologies for monitoring wind loads, developed by a Sea Grant Industrial Fellow, are being used to better understand wind loads on low rise buildings (such as residential homes) in the convective eyewall regions of hurricanes. Doppler Radar research indicates complex wind structures exist in the eyewall region. Understanding wind characteristics and the resulting wind loads will improve the ability of government and industry to establish cost effective mitigation measures. To date four homes have been outfitted with cabling and brackets that will allow the setup of instrumentation when a hurricane threatens the area. The homes have also been retrofitted to some extent and the performance of the retrofits will be evaluated when a storm strikes the area.

Emerging Technologies

R/MT-4 – "Remediation of Haloorganic Pollutants with Spartina alterniflora" – L. Marton (University of South Carolina) - The research team develops super-dehalogenerator plants by conventional breeding and gene transfer from saltmarsh cordgrass, *Spartina alterniflora*. Haloorganic degradation activity of wild type and elite lines have been characterized at the physiological and molecular level. Such a genetically improved plant is targeted for use in remediation of trichloroethene and halogenated phenol pollutants in soils or estuarine and salt marsh habitats. The technology for actual field use of these plants is being developed simultaneously.

R/MT-5 – **"Marine Evolutionary Ecotoxicology – Using Genomics and Population Genetic Theory to Infer Impact of Contaminants on Natural Populations"** – J. Quattro (University of South Carolina) – The inland silverside, an estuarine "sentinel species," is being used to measure population genetic responses to contaminant history across select sites with various qualitative and quantitative levels of contamination. The researchers are using theoretical and empirical population genetics to determine chronic and subtle effects of pollutants on marine and estuarine resources resulting from anthropogenic activities. They are now developing molecular assays for indicator alleles that serve as molecular probes, or biomarkers, for assessing effects of environmental stressors on organisms. Five putative 'responsive' and 'non-responsive' biomarkers have been assayed in a number of individuals collected throughout the species' range with recent emphasis on populations in South Carolina. Preliminary results suggest higher levels of genetic diversity at those biomarker loci for which evidence exists for a link to contaminants. One product will be genetic assays to identify exposure levels of contaminants of concern in South Carolina.

R/MT-6 – "Development of cDNA Micro-arrays for Analysis of Environmental Stressors and Disease in Local Populations of Atlantic White Shrimp" – P. Gross (Medical University of South Carolina). The overriding aim of this work is in the training of a new generation of scientists in the new and cutting edge technologies related to high throughput molecular genetics and

bioinformatics-based data analysis of the large data sets generated from these approaches. The specific scientific goal of the project seeks to generate cDNA microarrays to analyze genetic response of litopenaeid shrimp to a variety of stressors. Three graduate students are currently working on different phases of this project. One student has generated targeted cDNA libraries by subtractive suppression hybridization to populate the microarrays with stress relevant genes and is constructing the microarray. A second student is using a "reverse" genetic approach to examine the global effects of changes in signal transduction gene expression using these microarrays and RNA interference gene silencing. A third student has developed a suite of web-based bioinformatic tools for organizing, analyzing and disseminating the collected data from these efforts and is now concentrating on advanced microarray analysis tool development using machine learning approaches.

Coastal Communities and Economies

A/CG-1 – "Addressing the Challenges of Coastal Growth in South Carolina: A S.C. Sea Grant Consortium Initiative" – R. DeVoe (S.C. Sea Grant Consortium) – The Consortium's "Coastal Growth Initiative" seeks to (1) develop a coordinated approach to outreach education related to coastal land use impacts on natural resources; (2) establish a support framework to enhance the SC NEMO program; (3) develop outreach education programs to offer advice and assistance to coastal communities in developing comprehensive land use plans consistent with environmental health and resource conservation; and (4) enhance delivery of information developed through Sea Grant land use research programs such as LU-CES (see below).

Marine Aquaculture and Fisheries

R/SE-1 – "Impacts of Stocked Red Drum on the Recreational Fishery in Murrell's Inlet: Phase I Biological Considerations" – T. Smith (SCDNR – Marine Resources Research Institute) – This project will examine the potential of increasing the red drum population in Murrell's Inlet, one of the most heavily developed and fished coastal areas in SC. Adults were captured and spawned as planned and an estimated 553,000 juveniles (19-23 mm TL) were stocked (767fish/ha2 Spartina nursery habitat). This stocking exceeds goal by 28%. Prior to release, all fish were immersed in oxytetracycline-HCL to mark the otolith so that contribution of stocked fish can be assessed when fish reach creel size (following fall/winter). Fish were hauled at a density of 30g/L which resulted in low mortality. Total harvesting, transporting and stocking time was about 7-8 hours and mortality was estimated to be approximately 5% which was quite satisfactory. Substantial news media coverage occurred during the three stocking events with resulting TV and news media reporting provided to the pubic. A local politician and angling club members witnessed the stocking activities. All projects activities were successfully accomplished.

R/A-33 – "Application of Emerging Marine Water Treatment Technologies for Use in Zero Exchange Biosecure Super-Intensive Shrimp Production Systems" – C. Browdy (SCDNR – Marine Resources Research Institute) – The research team is examining future expansion and development of the U.S. commercial shrimp farming industry by the application of zero exchange, biosecure, super-intensive shrimp production systems. Preliminary financial analyses suggest the importance of intensification and growth rate for feasibility. The present research project has provided a key breakthrough in efforts to increase production above 3kg/M2 through the use of

filtration technologies. The cropping of organic material and collection as sludge allows significant improvements in growth and survival in the microcosm tanks, particularly as densities are increased. Through support of the USDA US Marine Shrimp Farming Program, further analyses indicate correlations with increasing net ecosystem production in treatments with improved survival and growth. Year 2 studies will further explore filtration technologies and provide more information on the fate of carbon and nitrogen in these systems.

Marine Education and Training

E/O-16 – "COASTeam Aquatic Workshops – A School-Wide Approach to Integrating Marine and Aquatic Concepts into the K-5 Science Curriculum" – L. Sautter (University of Charleston, SC) – The COASTeam marine education program addresses ongoing efforts to meet the needs of South Carolina elementary teachers for standards-based science activities. The goal is to encourage teachers to integrate marine and aquatic concepts into their existing curriculum. For the reporting period, 31 K-2 teachers completed one of the COASTeam Aquatic Workshops; and an estimated 750 K-2 students were taught by teachers who completed COASTeam training. COASTeam Aquatic Workshops are offered in partnership by the COASTeam Program and the South Carolina Aquarium. Each teacher who successfully completes one of the Aquatic Workshops is given a free class field trip to the SC Aquarium.

7.4.1.b. Sea Grant National Projects

E/C-2 "Sea Grant Abstracts Production and Publication" – F.C. Shephard (Woods Hole Data Base, Inc.) – Now in its seventeenth year, Sea Grant Abstracts has established itself as a valuable tool for aiding Sea Grant's goals in technology transfer, education, and development. Hard copy and electronic versions reach complementary readerships.

A/NO-1 "Sea Grant Haznet" - R. Bacon (S.C. Sea Grant Extension Program) - With support from NOAA's Coastal Services Center, developed a Sea Grant coastal hazards Web site www.haznet.org, and the architecture and graphics have been re-designed. The HazNet Web site will become the Web site of the Sea Grant Hazards Theme Team. Discussions have been initiated with the National Sea Grant Office and the USDA to conclude a cooperative agreement between HazNet and EDEN for resource sharing and to create an expanded hazards outreach education network.

7.4.1.c. Other Grants and Activities

R/FT-1 "Cooperative Institute for Fisheries Molecular Biology" - DeVoe, et al. (SCSGC, University of South Carolina, SCDNR-MRRI, NOAA/NOS/Charleston Lab) - The 2001-2004 Comparative Institute for Fisheries Molecular Biology (FISHTEC) research project continues to enhance knowledge about the population biology of commercially important pelagic fish species, such as tunas and swordfish. PCR-based technologies are now being used to better understand shark population genetics as these fishes become threatened. Other research will begin to focus on issues related to "Ecologically Significant Areas" (fish habitat). Southern flounder, croaker and scup are now being studied. An effort began during the reporting period to develop a workshop where there will be interaction between scientists, fisheries managers and fishermen. The purpose is to foster the exchange of information and seek guidance for future efforts of the

FISHTEC research team. In that way, resources will be applied to the pressing needs of managers the commercial fishing industry.

R/GS-2 "South Carolina/Georgia Coastal Erosion Study" - DeVoe, et al. (SCSGC, University of Charleston, S.C., Coastal Carolina University, Clemson University, University of South Carolina, Skidaway Institute of Oceanography, Georgia State) - Investigators from five South Carolina and Georgia research institutions and the U.S. Geological Survey, with funds provided through the USGS Coastal and Marine Geology Program, are continuing work towards the development of a conceptual model of the sediment budget for the South Carolina coast. Phase II of the Coastal Erosion Study is now in its third year, providing funding for eight discrete research and data management projects. In addition, investigators are pursuing new avenues of funding. In the spring of 2003 the study team presented results and papers at a major conference of coastal engineers and geologists in St. Petersburg, Florida.

R/COP-7 "The South Atlantic Bight Land Use - Coastal Ecosystem Study (LU-CES)" - DeVoe and Kleppel (SCSGC, University of South Carolina, Marine Resources Research Institute-SCDNR, Clemson University, University of Georgia, Georgia Institute of Technology, Skidaway Institute of Oceanography) – The study is now completing its second year of fieldwork. LU-CES scientists and program managers participate in regular strategy meetings to fine-tune the integrated research program, coordinate fieldwork, develop and refine field research efforts, and present and share research information as it is generated. LU-CES efforts are conducted by five research teams (Physical Attributes and Hydrology; Geochemistry and Nutrients; Toxic Contaminants and Ecological Effects; Land Use; and Database Management/GIS/Modeling) and an education/outreach team, consisting of more than 40 scientists, students, and staff.

Since last year's accountability report, the LU-CES interactive Web site (www.lu-ces.org) is beginning to serve as an information hub and is facilitating the exchange of data, findings, and relevant products among participating scientists and with resource managers and community leaders responsible for making land-use decisions. On June 23-24, 2003, a retreat was held in Charleston for LU-CES principal investigators, graduate students, administrators and the outreach team in order to facilitate the sharing of information discuss new research directions and continue to build the team approach of this diverse group of scientists. The principal investigators presented progress reports at the retreat.

OCE-0215402 "SouthEast Center for Ocean Sciences Education Excellence (SouthEast COSEE)" – DeVoe and Spence (SCSGC) – SouthEast COSEE is one of seven, regional centers funded through the National Science Foundation, with additional funding from NOAA/Ocean Explorations and NOAA Coastal Services Centers. SouthEast COSEE is administered through the South Carolina Sea Grant Consortium. Additional funds come from grants. The mission of SouthEast COSEE is to strengthen partnerships and forge new ones to provide opportunities to learn from each other's experiences, collaborate to leverage limited resources, and work together to systematically build capacity for integrating ocean science into education in novel ways. During this time period, SE COSEE addressed each of its six objectives with activities and effort – a 100% success rate.

7.4.2. S.C. Sea Grant Extension Program

7.4.2.a. Administration and Management

A revised S.C. Sea Grant Consortium/Clemson University Extension Service Memorandum of Understanding was formally signed on March 26, 2001. The new MOU continues to effectively integrate the S.C. Sea Grant Extension activities with the extension activities of Clemson University, resulting in greater programmatic synergies, efficiencies and results aligned to the strategic goals of the Consortium.

7.4.2.b. Staffing

In the period July 1, 2002 through June 30, 2003, the SC Sea Grant Extension Program had two staff vacancies. A Coastal Hazards Specialist position supported by Consortium and Clemson University Extension Service funding was unfilled due to a lack of state matching funds. The Consortium is exploring alternative sources of funding for this position. Similarly, a Coastal, Recreation and Tourism Specialist position, vacant since the last reporting period, has remained vacant also due to a lack of state matching funds. The Consortium is continuing its efforts to find alternative funding to enable this position to be filled.

7.4.2.c. Program Update

As a group, the Extension Program staff published, or has *in press*, 23 technical papers. The staff made 36 key presentations, workshops, and exhibits during the reporting period.

The following are selected examples of recent S.C. Sea Grant Extension Program activities and accomplishments:

- Developed outreach/education implementation strategies for the Consortium led Land Use – Coastal Ecosystem Study (LU-CES).
- Served on the National Estuarine Research Reserve (NERR) ACE Basin Coastal Training Program Committee. Program development and implementation is a collaborative effort among SC DHEC/OCRM, NOAA/CSC, and the SC Sea Grant Consortium.
- Led the Consortium's Coastal Growth Initiative. The focus of the Initiative is to assist local governments to develop comprehensive land use plans consistent with environmental health and resource conservation and economic development.
- Worked on behalf of the S.C. aquaculture industry to reverse a ban by the Virginia Marine Commission on the importation of clam seed from southern states, including South Carolina. The reversal allowed a S.C. commercial aquaculture industry valued at $500,000 per year to continue.
- Conducted a Harmful Algal Bloom Workshop at NOAA's Center for Coastal Environmental Health and Biomolecular Research (CCEHBR) in Charleston, S.C. The workshop was intended as an in-service training session for Clemson Extension agents, the workshop drew several agents, as well as representatives from NOAA, S.C. Department of Health and Environmental Control, S.C. Department of Natural Resources, University of South Carolina, U.S. Geological Survey, city of Myrtle Beach, city of Charleston, city of Isle of Palms, Town of Hilton Head,

and Kiawah Island Community Association.

- Serve on the S.C. Task Group on Toxic Algae (SCTGTA). Scientists, state and federal resource officials, communications staff, and extension personnel discuss monitoring coastal waters, continuing research on toxic algae, providing analysis of potential impacts, and establishing methods of effective public outreach and education. The SCTGTA has recently developed a coordinated state strategy to cope with potential toxic algal blooms in South Carolina waters.
- Continue to serve on the Coastal Pesticide Advisory Committee (CPAC). CPAC is comprised of representatives from Federal and state regulatory and non-regulatory agencies and organizations. CPAC meets quarterly to discuss the current state of pesticide use in coastal areas, develop strategies to minimize adverse impacts and investigate fish kills for evidence of possible pesticide misuse. CPAC is an informal non-regulatory group that educates pesticide users about the safe and proper use of pesticides in coastal areas.
- Serve on the Clemson University Extension Service Aquatic Buffer Demonstration Project (SC DHEC/EPA 319 Grant) which has established demonstration sites along the Waccamaw River in Conway, Lake Murray near Lexington, and Lake Greenwood near Greenwood for aquatic landscaping and water quality control.
- With Clemson University faculty, worked on the construction of a *Profitable Animal and Plant System* (PAS) for the production of algae for growing clams. This system is part of an SBIR grant through Atlantic Farms and Clemson University.
- Assisted aquaculture producers in the organization and presentation of comments at a US Fish and Wildlife Service hearing on the proposal to prohibit shellfish management and shellfish aquaculture in the Cape Romain Wildlife Refuge. There is an application for clam farming in the area. USF&WS now can restrict commercial ventures in the entire 300,000 acre area, which is probably the most product shellfish area in SC.
- Assisted the South Carolina Dept. of Natural Resources with its shellfish restoration project in Pawleys Island.
- Developed a management program for a 23-acre lake at Broadway at the Beach. The lake, the centerpiece of the huge development, had major problems with algae and muddy water due to fish stocks in the pond.
- Developed pond management plans with Ducks Unlimited on two large properties in Charleston County that will be developed into conservation easements.
- Developed and conducted a Stormwater Best Management Practices (BMP) Academy in Charleston, SC. Over 50 engineers attended the short course, which was focused on which BMPs are the most functional, which design techniques are most effective, and what site considerations have the greatest impact on design efficiency.
- Completed S.C. NEMO (Non-Point Source Education for Municipal Officials) programs in the Waccamaw, Seneca and Saluda watersheds. NEMO workshops were conducted in Oconee, Pickens, Anderson, Greenville, Laurens, Greenwood, and Abbeville counties. Twenty-four (24) additional NEMO presentations were also given in various locations statewide. A NEMO website (www.scseagrant.org/scnemo) was also completed.
- A NEMO Inservice Training for Clemson Extension Community Leadership and Economic Development agents was conducted at the Sandhills REC. Training participants were instructed about the use of natural resource based comprehensive planning, the importance of innovative site design, and the wise use of best management practices. Participation in NEMO will allow CLED agents to bring the expertise of Clemson University to elected and appointed officials in targeted watersheds throughout the state.

- Partnered with the Berkeley, Charleston, Dorchester Council of Governments to deliver seventeen (17) Coastal NEMO presentations. Presentations were made in Charleston, Berkeley, Dorchester, Colleton and Beaufort counties. Each sub-watershed within the study area received individual attention, including map development, comprehensive plan analysis, and presentation delivery.
- Worked with the Folly Beach Planning Commission and the BCD COG, to make recommendations for a tree protection ordinance for the City of Folly Beach. The Commission presented the recommendations to the Folly Beach Town Council which incorporated them into a town tree protection ordinance.
- Hosted the 2nd NEMO University national conference in Charleston. There were 65 attendees from 25 states, representing 20 of the 23 National NEMO Network projects from around the country.
- With the DHEC Office of Ocean and Coastal Resources Management, initiated the Carolina Clearwater Contractor water quality education program. The program objective is to train contractors and heavy machinery operators involved in land clearing activities in erosion control BMPs.
- Made numerous S.C. Coast-A-Syst Program presentations to over 350 S.C. citizens in Edisto Beach, Beaufort, Sun City, Charleston, Georgetown and Hilton Head. The SC Coast-A-Syst program is a series of self-assessments, or checklists that make it easy for homeowners to record activities and conditions around the home that may affect water quality. www.clemson.edu/sccoastasyst
- Co-chaired a regional Extension training conference, Stormwater Phase II: Positioning Extension to Take the Lead, in Wilmington, NC. Over 60 Extension agents, specialists, and directors attended from South Carolina, North Carolina, Georgia, Alabama and Florida.

7.4.3. Communications and Information Services

During FY02-03, the Consortium's Communications and Information Services group wrote and produced more than 75 publications, and had 261 media placements.

7.4.3.a. *Coastal Heritage* Magazine

Four issues of *Coastal Heritage*, the Consortium's premier publication, were produced. Major topics included hurricane evacuation, maritime history, urban sprawl, and wildlife in urban areas. The magazine received a national "APEX Grand Award" for excellence in design and writing.

7.4.3.b. Other Key Products

Other notable communications products include the National Sea Grant College Program Biennial Report – 2000-2001 and the Eastern United States Interstate Shellfish Seed Transport Workshop booklet.

The CIS group designed and posted the SCNEMO Web site. It won the "1st Place" Clemson Extension Web Site Communications Award for content and graphic design.

7.4.3.c. S.C. Sea Grant Consortium Web site

The Consortium's staff continues to enhance the SCSGC Web site (www.scseagrant.org) by expanding its interactive features, making the site more assessable to people with disabilities, and keeping the information current. The site features an array of information about coastal and marine issues for researchers, educators, students, and the public. The SCSGC Web site played a more prominent role in the Consortium's FY04-06 request for proposals, making it easier for researchers to do business with us.

7.4.3.d. Beach Sweep/River Sweep 2002

Beach Sweep/River Sweep, South Carolina's largest one-day volunteer-driven clean-up, was held September 21, 2002, and celebrated its 14-year anniversary. Organized and coordinated by the Consortium and the S.C. Department of Natural Resources, Beach Sweep/River Sweep 2002 engaged nearly 6,000 volunteers, who picked up over 59 tons of trash, compared with 35 tons for the previous year – a 41% increase in tons of trash removed from the environment.

7.4.3.e. Communications Awards and Recognition

Each issue of the *Coastal Heritage* quarterly magazine focuses public attention on a coastal theme selected in accordance with the Consortium's program areas and current events on a state or national level. In addition to its biennial mailing list purge, the Consortium receives regular feedback, both written and oral, on the magazine. Among those who have noted the valuable contribution *Coastal Heritage* makes toward raising public awareness and understanding are civic/business groups, the news media, educators, and other agencies involved in managing natural resources. The magazine has won numerous awards in past years. In FY02-03 the magazine received the following awards:

- Blue Ribbon Award, Sea Grant Week 2003
- 2003 APEX Grand Award

7.5. Student Fellowships

7.5.1. Dean John A. Knauss Marine Policy Fellowship

The National Sea Grant College Program sponsors the Dean John A. Knauss Marine Policy Fellowship Program to advance marine-related educational and career goals of participating students and to increase partnerships between universities and government. The fellowship provides a unique educational experience to students who have an interest in ocean, coastal, and Great Lakes resources in the national policy decisions affecting those resources. Each year, fellowships are awarded on a competitive basis at the national level. Selected Knauss Fellows are hosted by the legislative and executive branches of federal government.

For FY02-03, one of S.C. Sea Grant Consortium's applicants was awarded this prestigious fellowship, and she began her one-year assignment in the Executive Branch effective February 1, 2003. During the selection process we interviewed six applicants and recommended four to the

national office. Two of the four were selected as finalists, but one applicant decided to pursue a different career path. Of the six candidates, five were from the University of Charleston's masters programs in environmental studies and marine biology, and one from the University of South Carolina's graduate program in marine science.

7.5.2. Coastal Management Fellowship

The National Oceanic and Atmospheric Administration (NOAA) Coastal Management Fellowship provides on-the-job education and training opportunities for postgraduate students in coastal resource management policy and also provides specific technical assistance for state coastal resource management programs. The program matches highly qualified students with hosts around the United States in state coastal zone management (CZM) programs.

For FY02-03, the S.C. Sea Grant Consortium's applicant in a nationwide competition was selected and matched with a CZM program. She is completing her Master of Science degree in the University of Charleston's Environmental Studies program and will be working with Connecticut's Coastal Zone Management program on a project titled "Public Access to Coastal Environments (PACE)." The outcome of this project is the development of a public access database and Web site. The Fellow will develop a comprehensive GIS database of shoreline property ownership classification and use it to help the state organize, analyze, and share information related to public access to coastal environments in Connecticut.

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Appendix A
SC Sea Grant Consortium Organization Chart

(see next page)